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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 2 and 15	)	
of the Commission's Rules to Permit	)	ET Docket No. 94-124
Use of Radio Frequencies Above 40 GHz	)	RM-8308
for New Radio Applications	)	

COMMENTS

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SUMMARY

To encourage innovation, development of "millimeter wave" technology, and increased export of U.S. telecommunications products, in the captioned Notice of Proposed Rule Making ("NPRM"), the Commission proposes reallocating certain bands above 40 GHz for commercial licensed and unlicensed services. The Fixed Point-to-Point Communications Section, Network Equipment Division of the Telecommunications Industry Association ("TIA"), generally supports adoption of the NPRM. Nevertheless, TIA herein seeks to complement the NPRM by proposing that the Commission also allocate the 48.5 - 51.4 GHz and 55.2 - 58.2 GHz bands exclusively for private and common carrier fixed point-to-point microwave service.

The Commission, in the NPRM, contemplates that this millimeter wave spectrum would be available for fixed video, voice, and data transmission services throughout a designated geographic area. However, specific frequencies would not be assigned to each of these services. Instead, frequencies would be used for particular services on an ad hoc, "open market" basis because licenses would be awarded by auction. Licensees would have broad flexibility to choose technologies and bandwidths of fixed applications, subject only to technical rules protecting against harmful interference.

Given the short-haul, wideband characteristics of the frequencies above 40 GHz, this spectrum should be quite useful for the microwave backbone of emerging personal communications service ("PCS") and other wireless networks. Moreover, these frequencies could support the other telecommunications services that private and common carrier fixed point-to-point microwave users provide, such as emergency, public health and safety services,

and services for local exchange carriers, cellular licensees, utilities, railroads, petroleum companies, and financial institutions. Finally, the short-haul, fixed point-to-point frequencies above 40 GHz also could be used for private LAN-to-LAN interconnection, surveillance, and other related applications.

Unfortunately, it is uncertain that sufficient spectrum for these microwave networks will be available to support such new technologies. For example, due to anticipated congestion, the Commission recently imposed significant limitations on applications for 38 GHz fixed point-to-point microwave systems in PCS networks.[1] Other potential spectrum for fixed point-to-point microwave PCS support systems, such as the 4, 6, 11, 18, 23 and 28 GHz bands, either are inappropriate because they are for long-haul paths, are already congested, or are proposed for reallocation to an incompatible service.

In particular, the 28 GHz band, which is proposed to be reallocated for the Local Multipoint Distribution Service ("LMDS"), is more appropriate for fixed point-to-point microwave service. As an alternative, TIA recommends that the 40.5 - 42.5 GHz band be reallocated for LMDS, and that the 28 GHz band be reallocated for fixed point-to-point microwave use. These alternative allocations correspond to international allocations.

Provision of fixed point-to-point service in the bands above 40 GHz cannot be guaranteed in the Commission's contemplated "open market." Services will not be assigned to specific frequencies, but will be assigned by winning bidders. Availability of adequate fixed

[1] Common Carrier Bureau Established Policy Governing the Assignment of Frequencies in the 38 GHz Band and Other Bands To Be Used in Conjunction With PCS Support Communications, Public Notice, 75 Rad. Reg. (P&F) 2d 1341 (1994).

point-to-point microwave spectrum for all markets, in an interference-free environment, would be virtually impossible under these circumstances.

Fixed point-to-point microwave users need protection against harmful interference, they need wide bands to support PCS and other services, they need to know that the same frequencies will be available in all areas, and they need uniform, but flexible, technical standards. Unless the Commission makes some of the specified bands above 40 GHz available exclusively for fixed point-to-point microwave use, PCS, as well as the other traditional public safety and business services that rely on these networks, will be threatened. Thus, in addition to the "open market" allocation proposals to the NPRM, TIA recommends that the Commission carve out a separate and exclusive allocation for fixed point-to-point microwave users.

Consistent with the Commission's goal of promoting economic growth domestically by opening up markets overseas for U.S. products,[2] and in response to the Commission's invitation to suggest alternative bands above 40 GHz that might be desirable,[3] TIA respectfully requests that the Commission, as part of the NPRM:

- Reallocate the 48.5 - 51.4 GHz and the 55.2 - 58.2 GHz bands for exclusive use by private and common carrier fixed point-to-point microwave users to match existing or proposed international allocations.

- Reallocate LMDS to the 40.5 - 42.5 GHz band and reallocate the 28 GHz band for fixed point-to-point microwave service to match existing or proposed international allocations.

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[2]NPRM at paras. 3 and 7.

[3]NRPM at para. 12.

- License these bands under the proposed Part 101,[4] and, consistent with clear statutory requirements, exempt these licenses from auction.[5]

- Revise the proposed allocation of the 47.2 - 48.2 GHz band by: (i) eliminating the 47.2 - 47.4 GHz allocation for unlicensed vehicular radar systems and reallocating that 200 MHz for such radar systems to anywhere in the 45.0 - 47.0 GHz band; and (ii) moving the 800 MHz to be allocated for licensed use from 47.4 - 48.2 GHz to 47.2 - 48.0 GHz. These changes are required to provide a 500 MHz guardband between the proposed licensed uses and the proposed private and common carrier fixed point-to-point microwave allocation starting at 48.5 GHz.

- Establish formal procedures to improve spectrum sharing between the government and the private sector, including, at a minimum, reducing the time needed to coordinate frequencies between government and private users from weeks to hours.

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[4]See Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, Notice of Proposed Rulemaking, WT Docket No. 94-148 (FCC 94-314, released Dec. 28, 1994).

[5]47 U.S.C. Section 309(j) (1994).

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To: The Commission

COMMENTS

Pursuant to Section 1.415 of the Commission's Rules,[1] the Fixed Point-to-Point Communications Section, Network Equipment Division of the Telecommunications Industry Association ("TIA"),[2] hereby comments on the above-captioned Notice of Proposed Rule Making ("NPRM") to allocate additional spectrum above 40 GHz.

The Commission proposes "to open for commercial development and use a portion of the 'millimeter wave' frequency bands above 40 GHz."[3] It contemplates that these new bands "will permit the development of short-range wireless radio systems with communications capabilities approaching that now achievable only with coaxial and optical

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[1]47 C.F.R. Section 1.415 (1989).

[2]TIA is the principal industry association representing fixed point-to-point microwave radio manufacturers. TIA members serve, among others, companies, including telephone carriers, utilities, railroads, state and local governments, and cellular carriers, licensed by the Commission to use private and common carrier bands for provision of important and essential telecommunications services.

[3]NPRM at para. 1.

fiber cable" and that these systems "could support many short-range applications . . . requir[ing] very high bandwidth or data transfer rates."[4]

TIA applauds this proposal as an appropriate first step in providing needed spectrum for fixed users. Unfortunately, in seeking to provide such spectrum, the Commission disregards the needs of private and common carrier fixed point-to-point microwave users. These users need spectrum to support personal communications service ("PCS"), other wireless networks, and emerging short-haul point-to-point fixed applications. Herein, TIA respectfully proposes a further reallocation that will satisfy the needs of these fixed point-to-point microwave users without compromising the availability of the spectrum above 40 GHz proposed for reallocation to commercial users.

Specifically, TIA requests that, in addition to the proposed reallocations in the bands above 40 GHz for fixed commercial services, the Commission allocate the 48.5 - 51.4 GHz and 55.2 - 58.2 GHz bands exclusively for fixed point-to-point microwave services. These bands match interim European Conference of Post and Telecommunications Administrations ("CEPT") allocations for fixed point-to-point use.[5] Moreover, in the near future, the International Telecommunications Union ("ITU"), the international telecommunications standards setting organization, is expected to adopt these allocations for fixed point-to-point use. Thus, adoption of TIA's proposal not only would promote the microwave and PCS markets domestically, it would spur export of U.S. products.

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[4]NPRM at para. 2.

[5]CEPT is responsible for setting European telecommunications standards.

It is critical that the bands TIA proposes for reallocation must be exempt from competitive bidding. First, under Section 309(j) of the Communications Act of 1934, as amended (the "Act"), and Commission rules adopted thereunder, microwave licenses cannot be subject to auction.[6] Second, the fixed point-to-point microwave service requires, at a minimum, specific channel assignments in all service areas, interference criteria, and reliability standards. None of these essential building blocks would result from the Commission's proposed "open market" reliance on auctions instead of rule making. Thus, TIA recommends that, in the bands above 40 GHz, the 48.5 - 51.2 and 55.2 - 58.2 GHz bands should be exempt from auctions and should be subject to the specific licensing and technical requirements which will be prescribed in Part 101.[7]

The 48.5 - 51.2 and 55.2 - 58.5 GHz bands are allocated on a shared basis to non-government and government users. If government users seek access to these bands, improvements in spectrum management and frequency coordination techniques must be made. For example, private sector coordination for non-government bands can be accomplished in days. Unfortunately, coordination of non-government uses in government bands takes weeks. Such delay is unacceptable. This time frame must be reduced significantly.

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[6]47 U.S.C. Section 309(j) (1994); 47 C.F.R. Section 1.2102 (1994).

[7]See Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, Notice of Proposed Rulemaking, WT Docket No. 94-148 (FCC 94-314, released Dec. 28, 1994). As detailed herein, TIA recommends that the 40.5-42.5 GHz band be reallocated for the Local Multipoint Distribution Service ("LMDS") and that the 28 GHz band be reallocated for fixed point-to-point microwave service. All fixed point-to-point 28 GHz licenses also must be exempt from auctions and must be subject to Part 101.

REALLOCATION OF BANDS ABOVE 40 GHz IS IN THE PUBLIC INTEREST

In the NPRM, the Commission proposes reallocating a portion of the "millimeter wave" frequency bands above 40 GHz because it:

> will provide the American public with access to new products and communications services; provide new opportunities for American business and industry; and, promote new jobs and economic growth in the United States.[8]

Specifically, the Commission would:

- Allocate: (i) 16 GHz between 47.2 and 153 GHz on a shared basis with existing and future government users; and (ii) 2 GHz in the 40.5 - 42.5 GHz band for non-government users. The Commission proposes evenly dividing available spectrum between licensed and unlicensed uses, with unlicensed spectrum further divided between general unlicensed devices and unlicensed vehicular radar systems.

- Permit the licensed bands to be used for any presently allocated service. This service would be incorporated into Part 21. The Commission contemplates that many uses of millimeter wave spectrum are likely to be technically and operationally similar to those contemplated in the 28 GHz band for the LMDS (e.g., fixed point-to-point and point-to-multipoint services for video, voice and data transmission to subscribers throughout an area). Thus, the Commission proposes modeling its licensing rules for the millimeter wave bands after the rules and procedures proposed for LMDS and referring to these uses collectively as "Licensed Millimeter Wave Service" or "LMWS." The Commission proposes dividing available licensed spectrum for the LMWS into two (2) 400 MHz contiguous blocks and limiting licensees to only one of these blocks in a market. Given the anticipated broad range of uses and technologies in these bands, "some of which may require larger service areas," the Commission proposes to use the Rand McNally Major Trading Areas ("MTA") in LMWS licensing.

- Award licenses pursuant to auctions.

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[8] NPRM at para. 3.

- Allow licensees broad flexibility to choose technologies and bandwidth of fixed applications that they operate in the millimeter wave bands, subject only to technical rules intended to minimize interference to other licensed users of the bands. It proposes limiting the power of licensed transmitters to +16 dBW EIRP. The same spurious emission and frequency stability requirements would be used for licensed and unlicensed devices. Transmitters would be type-accepted.

A. TIA Generally Supports Adoption of the Proposed Reallocation.

TIA is the leading industry association for fixed point-to-point microwave manufacturers. It supports the Commission's goals in the NPRM of encouraging innovation and worldwide competitiveness:

> The millimeter wave region of the spectrum is a major resource that is essentially undeveloped and is unavailable today for commercial use. It has been our experience that opening regions of the spectrum to commercial applications and technologies fosters the development and growth of new industries and jobs . . . . We believe that opening portions of the millimeter wave spectrum will similarly stimulate new applications of radio technology for the American public, facilitate technology transfer from the military sector, and create opportunities for economic growth and jobs. This action will also promote United States competitiveness internationally by enabling development of technology for potential use in other parts of the world.[9]

B. Needs of Fixed Point-to-Point Microwave Users Must Be Satisfied.

As detailed herein, the Commission's proposals in the NPRM do not go far enough. The needs of fixed point-to-point microwave users are ignored in this proceeding. Satisfying the needs of these fixed point-to-point users must be a priority for the Commission in reallocating spectrum above 40 GHz.

In the NPRM, the Commission is almost totally biased towards high bandwidth applications and new services, to the unacceptable exclusion of existing service. Although area based licensing will dominate because of the flexibility it gives to fixed point-to-point

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[9]NPRM at para. 7 (footnotes omitted).

microwave users, non-area based, link-per-link, traditional, but simplified, licensing will be advisable for carriers to support PCS and other wireless networks and for private users, which have limited microwave needs but want to own their system. A number of RF channels should be reserved for link-per-link licensing applications. Small bandwidth links also will be needed on occasion for LAN-to-LAN networks, surveillance cameras, return links, and other similar applications, and should not be overlooked in this proceeding.

In the NPRM, the Commission invites comment on other uses for the bands above 40 GHz:

> We request comment on our proposed list of bands to be made available for use by millimeter wave technologies. In particular, we invite interested parties to address the suitability of the specific bands identified for use by millimeter wave technologies and, if appropriate, to suggest alternative bands that might be desirable to make available for use at this time. We also invite suggestions for rules that would enhance the use of specific bands for particular services.[10]

TIA responds to the Commission's invitation and herein suggests an alternative band allocation. The 48.5 to 51.4 GHz and 55.2 to 58.2 GHz bands must be reallocated exclusively for fixed point-to-point microwave users. Under applicable law,[11] these bands can not be subject to auction. Licensing and operation in these bands, instead, must be governed by the new Part 101.

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[10] NPRM at para. 12 (footnotes omitted).

[11] 47 U.S.C. Section 309(j) (1994); Implementation of Section 309(j) of the Communications Act - Competitive Bidding, Second Report and Order, PP Dkt. No. 93-253, 9 FCC Rcd 2348, 2350-56 (1994); 47 C.F.R. Section 1.2102 (1994).

SPECTRUM FOR FIXED POINT-TO-POINT MICROWAVE SERVICE MUST BE ALLOCATED IN THE BANDS ABOVE 40 GHz

Recently, fixed point-to-point users have been particularly hard-hit by the 2 GHz band reallocation.[12] Even though 2 GHz fixed point-to-point microwave users were relocated to the bands above 3 GHz, the long-term availability of adequate spectrum for their services in these and other bands is highly suspect.

A. Inadequate Spectrum Exists For PCS Backhaul Microwave Networks.

When the Commission allocated the 2 GHz band for PCS, it declined to allocate additional support spectrum to connect PCS cell sites.[13] Instead, the Commission assumed that spectrum allocated for fixed point-to-point microwave service is adequate to support PCS backhaul operations and that some of these support operations could be provided through non-radio media, such as fiber optic cable.[14] On reconsideration, the Commission persisted in this conclusion, but recognized "that it is important that PCS operations have access to adequate support spectrum."[15] Consequently, the Commission announced that

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[12]Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, Second Report and Order, ET Docket No. 92-9, 8 FCC Rcd 6495 (1993), modified, Memorandum Opinion and Order, 9 FCC Rcd 1943 (1994).

[13]Amendment of the Commission's Rules To Establish New Personal Communications Services, Second Report and Order, GEN Docket No. 90-314, 8 FCC Rcd 7700, 7740-41 (1993) ("PCS Second Report and Order").

[14]PCS Second Report and Order, 8 FCC Rcd at 7741.

[15]Amendment of the Commission's Rules To Establish New Personal Communications Services, Memorandum Opinion and Order, GEN Docket No. 90-314, 9 FCC Rcd 4957, 4971 n.26 (1994).

it would "examine more closely requests for use of the 38 GHz band to ensure that such requests are justified and that the spectrum is used efficiently."[16]

Indeed, there has been significant interest in using the 38 GHz band to provide microwave support for PCS. The Commission recently declared, in a Public Notice, that the volume of 38 GHz band fixed point-to-point applications for PCS support operations has "increased substantially" and that the availability of such spectrum must be protected.[17]

Alternative bands for PCS backhaul fixed point-to-point microwave networks generally are unavailable. Microwave links to connect PCS microcells typically will be short distances. The 4, 6, and 11 GHz bands, reallocated for fixed microwave use to clear PCS spectrum, are appropriate for long-haul systems but they would not be practical for PCS networks. The 18 GHz band, which is used primarily by Bell Operating Companies and other common carriers, has little spectrum available. Even the spectrum to be reallocated from government to non-government use will be inadequate because it is being done on a piecemeal basis, which forecloses fixed point-to-point microwave users from assembling the necessary frequencies.[18] Similarly, the 23 GHz band is full and is less appropriate for PCS and similar services because of high equipment cost and frequency reuse limitations.

Availability of the 28 GHz band for fixed point-to-point microwave is being threatened by the Commission's proposal that it be allocated for LMDS, which is primarily

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[16]Memorandum Opinion and Order, 9 FCC Rcd at 4971 n.26.

[17]Common Carrier Bureau Established Policy Governing the Assignment of Frequencies in the 38 GHz Band and Other Bands To Be Used in Conjunction With PCS Support Communications, Public Notice, 75 Rad. Reg. (P&F) 2d 1341 (1994).

[18]See, e.g., Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use, Notice of Proposed Rule Making, ET Docket No. 94-32 (FCC 94-272, released Nov. 8, 1994).

point-to-multipoint and thus incompatible with point-to-point use.[19] In the NPRM (para. 23), the Commission assumes that, in general, the assignment of the millimeter wave spectrum is likely to be technically and operationally similar to the contemplated 28 GHz LMDS. This assumption is incorrect. For one thing, point-to-point service cannot be provided in the LMDS because it is primarily a point-to-multipoint service. These services are incompatible. The little use LMDS makes of point-to-point links is directed by necessity of linking its cells together or by required extension of some of its multipoint links.[20]

TIA strongly supports the use of the 40.5 - 42.5 GHz band for LMDS applications as a replacement for the 28 GHz band. This proposal is consistent with international allocations. There is an international agreement on the fixed point-to-point microwave use of the 28 GHz band (ITU-R Recommendation 748). At the same time, CEPT has recognized that the 40.5 - 42.5 GHz allocation is well suited for LMDS (i.e., Multipoint Video Distribution Systems or "MVDS" in Europe). Moreover, the European Radiocommunications Committee ("ERC") decision, T/R 52-01, specifically recommends this band for MVDS. The ERC decisions are intended for implementation in the 40 CEPT countries. Use of MVDS in the 40.5 - 42.5 GHz band already has been formalized in the United Kingdom, under Radiocommunications Agency document MPT 1550.

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[19]Rulemaking to Amend Part 1 and Part 21 of the Commission's Rules to Redesignate the 27.5 - 29.5 GHz Frequency Band and to Establish Rules and Policies for Local Multipoint Distribution Service, Second Notice of Proposed Rulemaking, CC Docket No. 92-297, 9 FCC Rcd 1394 (1994).

[20]See TIA's August 22, 1994, letter to Susan Magnotti of the Commission's 28 GHz Negotiated Rulemaking Committee.

Only the 37.0-38.6 GHz band might be available, as it is subject to a pending September 9, 1994, TIA petition for rulemaking to allocate these frequencies for fixed point-to-point use.[21] The 37-38.6 GHz band also could be used to interconnect PCS microcells. However, the 48.5 - 58.2 GHz band that TIA recommends be reallocated for fixed point-to-point microwave service is useful for in-building and campus environments, while the 37-38.6 GHz band is more useful for wider areas. Thus, any action that the Commission may take with respect to the 37-38.6 GHz band would not satisfy all the needs for PCS backhaul systems.[22]

B. To Ensure International Compatibility, The Commission Must Allocate the 48.5 - 51.4 GHz and 55.2 - 58.2 GHz Bands to Fixed Point-to-Point Microwave.

As traditional fixed point-to-point microwave users are forced to higher and higher frequency bands to make spectrum available for PCS and other wireless technologies, they will need a series of alternative bands in the higher frequency range. The international telecommunications community already has foreseen this need. As detailed below, it is in the process of opening up spectrum above 40 GHz for fixed point-to-point microwave applications. This is especially critical because microwave systems are natural platforms for new technology developments. These fixed point-to-point microwave systems are leading resources for new high frequency technology developments.

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[21]RM - 8553.

[22]The Commission also assumes that alternative media, such as fiber optic cable, will be available for PCS support. This assumption is invalid because fiber optic cable is grossly unreliable and quite costly.

TIA's proposal would bring the United States spectrum allocation in these bands into the international standards set by CEPT. The CEPT standards already are being implemented by several countries. Equipment using these frequencies is already in place in the United Kingdom. Moreover, ITU, the international telecommunications standards-setting organization, is expected to adopt frequency allocations similar to those set by CEPT.

Under standards established by CEPT, the 48-5-51.4 GHz and 55.2-58.2 GHz bands are allocated for exclusive fixed point-to-point microwave use. These bands have a transmitter/receiver ("T/R") spacing of 1.47 GHz, which is more than adequate to provide fixed point-to-point microwave service.

Most band sizes proposed for the LMWS are approximately 500 MHz. At these high frequencies, the approximate 250 MHz T/R spacing makes it economically impracticable for fixed point-to-point microwave systems. Above 20 GHz, T/R spacing is generally in the order of, or higher than, 1 GHz, because of duplexer constraints and required filter rejection. Above 40 GHz, a 1.47 GHz T/R spacing standard has been adopted in Europe. In October 1993, ITU adopted a similar specification for its draft new recommendation on the 55 GHz band.

In addition to the obligation of having a 1 GHz or greater T/R spacing above 40 GHz, it is also advisable to align on recognized international telecommunications standards, such as the 1.47 GHz T/R spacing, when they have been established. For economic reasons, many low capacity microwave systems have only one local oscillator. The cost reduction which results is more significant in the millimetric bands than in lower frequencies. The intermediate frequency is therefore equal to the T/R separation. The part of the system, which is not frequency dependent, costs about 75% of the entire system.

To facilitate export of U.S. products, TIA urges the Commission to adopt its proposed reallocation. If the Commission intends opening foreign markets for devices operating in the bands above 40 GHz, it must allow interoperability with European and international standards. It is important to note that U.S. manufacturers have been especially successful in exporting high quality, high frequency point-to-point microwave products. No less than eight (8) U.S.-based companies presently are exporting microwave radios in the 18-50 GHz range. Thus, U.S. manufacturers have succeeded in establishing a solid market position in Europe, and TIA's proposed reallocation is necessary to ensure that these and other overseas markets remain vital and accessible.

Adopting rules that make the United States the sole dissident to otherwise global standards jeopardizes export opportunities for domestic companies and drives up manufacturing costs by requiring two different sets of procedures. TIA strongly urges the Commission to adopt the international standards in this area by allocating the above-mentioned bands for exclusive fixed point-to-point microwave use.

Matching international allocations and corresponding international standards has been, and must continue to be, an essential ingredient in domestic telecommunications and trade policy. For example, the National Telecommunications and Information Administration ("NTIA"), in its 1993 "Agenda for Action" for the National Information Infrastructure, stated that one of its goals is to

> [c]oordinate with other levels of government and with other nations. Because information crosses state, regional, and national boundaries, coordination is critical to avoid needless

> obstacles and prevent unfair policies that handicap U.S. industry.[23]

Similarly, the Commission consistently attempts to ensure that its domestic spectrum allocations are compatible with international spectrum allocations.[24] Based on this policy, it is incumbent on the Commission to follow the international precedent and allocate the 48.5-51.4 and 55.2-58.2 GHz bands for exclusive fixed point-to-point microwave use.

C. The 48.5 - 51.4 and 55.2 - 58.2 GHz Bands Must Be Subject to Specific Operating Rules and Not to the Proposed "Open Market" Approach.

The Commission's proposed "open market" approach would not work for fixed point-to-point microwave service because it lacks national or international interoperability. Instead of rule makings to determine how to assign the bands above 40 GHz to specific services, the Commission would delegate this authority to the marketplace as the bands will, in effect, be assigned by the highest bidder.

Channel blocks would be allocated to different parties in each service area or MTA. National companies, such as airlines, transporters of hazardous materials, railroads, oil companies, and other users of private radio, would have to purchase equipment they can operate in any MTA and on any frequency part of the allocation. Furthermore, if the Commission's goals of encouraging common carriers to compete for subscriber business are

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[23] The National Information Infrastructure: Agenda for Action, Dept. of Commerce, National Telecommunications and Information Administration, Dkt. No. 930940-3240, 58 FR 49025 (Sept. 21, 1993).

[24] See, e.g., Amendment of the Commission's Rules to Establish Rules and Policies Pertinent to a Mobile Satellite Service, Notice of Proposed Rule Making, CC Dkt. No. 92-166, 9 RCC Rcd 1094, 1096 (1994).

to be realized, then the end user must also have technology capable of switching from one carrier to another, requiring still more sophisticated and expensive equipment.

The price-tag on equipment consequently would be unnecessarily high, especially since such equipment would have to be able to tune over discontinuous bands. Costs associated with developing technology compatible with any carrier, any MTA, and over discontinuous bands, would stifle market development because there would be no uniform national or international standard to support innovative technology.

Most fixed point-to-point microwave users are national companies, such as utilities and telephone carriers, operating in many geographic areas. They often move equipment from location to location and often need to communicate with other fixed point-to-point microwave end users. Manufacturers simply cannot design hardware that will function in each location at a different frequency and in different interference environments. Using the international standards for frequency allocation proposed herein would avoid these pratfalls.

Specific frequency bands must be assigned for fixed point-to-point microwave use. Appropriate bandwidths and transmitter/receiver separation must be adopted. Applicable technical rules must be established. Manufacturers should not be expected to develop devices without some indication of the environment under which their products will be expected to perform.

Unfortunately, under the Commission's "open market" approach, it is highly problematic that any fixed point-to-point microwave uses could be accommodated. Absent band sharing and interference protection criteria that are precise and consistent throughout the country, users in these and other services will spend more time dueling with each other over access to the newly available frequencies than they would if the Commission takes this

opportunity to establish that the 48.5 - 51.4 and 55.2 - 58.2 GHz bands will be allocated exclusively to private and common carrier fixed point-to-point microwave services. Appropriate fixed microwave services then could be assigned frequencies and could be subjected to necessary technical and operating requirements that maximize their usefulness.

These needs can be satisfied without disturbing the proposals for the bands above 40 GHz made by the Commission in the NPRM. In addition to the "open market" approach for these bands, the Commission can allocate specific spectrum for fixed point-to-point microwave services and can adopt the needed rules for such services.

The Commission's decision to allocate spectrum above 40 GHz in two 400 MHz blocks, and its prohibition on ownership of more than 400 MHz of contiguous spectrum, must be abandoned for fixed point-to-point microwave users. In the internationally-recognized bands, fixed point-to-point microwave requires a contiguous band of 3 GHz. The Commission's decision to allocate spectrum in 400 MHz bands and the prohibition against obtaining both blocks in a band makes accumulating sufficient spectrum to conform with European or international standards impossible.

Because the 400 MHz blocks do not conform with analog or SONET standards, there does not seem to be any technological reason to require the same 400 MHz block allocation for the additional fixed point-to-point microwave spectrum. Moreover, the 48.5-51.4 and 55.2-58.2 GHz bands TIA proposes for reallocation are not used by other private sector carriers and there is no record of incompatible government use.[25] Therefore, satisfying

[25] See NPRM at para. 4.

fixed point-to-point microwave users' need for contiguous bandwidth would not hurt any other user.[26]

D. Specific Technical Standards For Fixed Point-to-Point Microwave Users Must be Established.

In the NPRM, the Commission proposes limiting the licensed transmitter power in the frequency bands above 40 GHz to +16 dBW EIRP.[27] This proposal apparently is based upon an assumed limit of -20 dBW of transmitted power.

There is no need to limit power to +16 dBW EIRP for the proposed fixed point-to-point microwave allocation. Higher power is needed for good reliability. Current commercial transmitters slightly below the proposed band can transmit at power levels up to -10 dBW. Consequently, TIA proposes a +40 dBW EIRP to allow for future development.

Due to higher attenuation and better antenna directivity at such high bands, spurious emission limitations may not have to be as stringent as for the lower frequency bands. A 60 dB spurious attenuation specification probably would be adequate for fixed point-to-point microwave systems. This limit could apply from 250% of the occupied bandwidth, up to the second harmonic of the transmitter (for obvious reasons of test equipment availability). Frequency tolerance specifications could remain relatively loose as long as the licensee is required to keep 99% of its emission (in terms of spectral power) within the absolute limits of its licensed bandwidth. At a time when most of that new spectrum is still unoccupied and

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[26]To accommodate this reallocation, certain proposals in the NPRM must be revised, as discussed below.

[27]NPRM at para. 33.

with the Commission's intention to promote innovation, it is advisable to keep technical constraints at a minimum. Out-of-band emission limits are, however, certainly required to protect the fixed users from the mobile users. Vehicular radar systems, for example, are a major concern for fixed microwave systems that may operate in adjacent bands. Frequency tolerance specifications also should be defined to prevent spilling of unlicensed system spectrum in adjacent bands.

The Commission proposes that transmitters operating in the LMWS bands be subject to type acceptance requirements prior to marketing.[28] TIA does not oppose this requirement in general. However, under current Parts 21 and 94, and under proposed Part 101, all fixed point-to-point microwave equipment is subject to notification, not type acceptance. Once the Commission reallocates the 48.5 - 51.4 and 55.2 - 58.2 GHz bands for fixed point-to-point microwave use, equipment authorization, and all other technical standards, must be subject to Part 101.

CERTAIN REVISIONS TO THE PROPOSED REALLOCATIONS ARE NECESSARY TO ACCOMMODATE FIXED POINT-TO-POINT MICROWAVE USERS

In the NPRM, the FCC proposes specific band allocations resulting in 18 GHz of spectrum between 40.5 and 153 GHz for commercial development. Of this spectrum, the 47.2 - 48.2 and 59.0 - 64.0 GHz bands would be allocated, on a shared basis, to government and non-government use, except that the 47.2 - 47.4 GHz band also would be allocated, on an unlicensed basis, for vehicular radar systems. In addition to the 47.2 - 47.4 GHz band for vehicular radar systems, the Commission also proposes allocating an additional 3 GHz for these systems above 76 GHz.

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[28] NPRM at para. 35.

The proposed reallocation of the 48.5 - 51.4 GHz and 55.2 - 58.2 GHz bands for fixed point-to-point microwave requires certain minimal changes in the foregoing proposals. At least 500 MHz of guardband between the fixed point-to-point microwave allocations and other uses of the bands above 40 GHz are necessary because these super high frequency bands require such a margin for signal selectivity.

For the 55.2 - 58.2 GHz reallocation, sufficient separation exists with the next reallocation at 59.0 GHz. Thus, TIA does not request any change in the Commission's proposed reallocation of bands above 59 GHz.

However, the Commission also proposes reallocating spectrum up to 48.2 GHz for licensed use. The 300 MHz between this proposed reallocation and the 48.5 - 51.4 GHz band proposed by TIA for fixed point-to-point microwave use is inadequate. To remedy this problem, TIA proposes that the 47.2 - 47.4 GHz band, proposed for vehicular radar systems, be eliminated and that the 47.4 - 48.2 GHz band, proposed for licensed use, be shifted to 47.2 - 48.0 GHz. This would retain the 800 MHz proposed for licensed use and would create a 500 MHz guardband between the licensed uses (i.e., 47.2 - 48.0 GHz) and fixed point-to-point microwave uses (i.e., 48.5 - 51.4 GHz). The 200 MHz proposed for allocation to the vehicular radar systems (i.e., 47.2 - 47.4 GHz) could be shifted to the 45.0 - 47.0 GHz band without causing any conflict to present or proposed non-government and government allocations.

THE FIXED POINT-TO-POINT MICROWAVE BANDS MUST NOT BE AUCTIONED

TIA strongly opposes auctioning the 48.5 - 51.4 GHz and 55.2 - 58.2 GHz bands reallocated for fixed point-to-point microwave use.[29] First, subjecting these bands to competitive bidding is contrary to the Act and to applicable Commission rules. Second, public policy dictates that these bands be exempt from auctions. Unlike commercial common carrier systems, private carrier systems do not generate adequate revenue to justify engaging in competitive bidding for a license. Thus, if auctions are imposed for fixed point-to-point microwave systems in the bands above 40 GHz, all private users, including those responsible for public safety and emergency services, and those responsible for providing services for utilities, financial institutions, internal needs, or other applications, effectively would be foreclosed from these frequencies.

Under Section 303(c) of the Act, Congress is obligated to:

> [a]ssign bands of frequencies to the various classes of stations, and assign frequencies for each individual station and determine the power which each station shall use and the time during which it may operate. . . .[30]

Unfortunately, the Commission's "open market" proposal evades this statutory responsibility under Section 303(c) of the Act. Frequencies in the newly allocated bands above 40 GHz would be assigned to various classes of stations, not by the Commission, but by the highest bidders.

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[29]TIA also opposes auctioning 28 GHz band fixed point-to-point licenses.

[30]47 U.S.C. Section 303(c) (1991).